

ABSTRACT

The combination of a Vivaldi slot and a meander line loaded antenna is provided which exhibits an ultra wideband characteristic with the Vivaldi notch expanding the high end and with the meander line loaded antenna portion reducing the low frequency cut-off. When these antennas are arrayed, this array exhibits a single lobe and an ultra wide 100:1 bandwidth. The Vivaldi notch portion of the antenna accommodates the higher frequencies, whereas the meander line loaded antenna portion of the antenna accommodates the lower frequencies, there being a smooth transition region between the Vivaldi and meander line portions of the antenna and no discontinuity. In one embodiment, the antenna is made to work between 50 MHz and 1500 MHz with a VSWR less than 3:1. The Vivaldi notch meander line combination assures that for an array one does not have a separation of the elements more than a 0.5 wavelength at the highest frequency, thus to eliminate the possibility of creating grating lobes. As one goes down in frequency to 1/50 of the highest frequency, the 0.5 wavelength is divided by 50. This means that antenna element spacing is .01 wavelength at the low frequency end, clearly below that separation which would cause grating lobes. In short, the generation of grating lobes at the high end is prevented because the antenna element spacing is less than a 0.5 wavelength, with the situation improving as one goes down in frequency.